DETAILED ACTION

Claims status

1. In the amendment filed on October 14, 2011, claims 1-29, 32 and 49 have been cancelled and claims 30-31, 33-47 and 50-51 have been amended. Therefore, claims 30-31, 33-48 and 50-51 are currently pending for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 30-31, 33-48 and 50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 30 recites "the monitoring device" in line 18 and "said at least one electrical quantity" in line 25 without sufficient antecedent basis in the claims. For the purpose of examination, Examiner will assume "the monitoring device" as "the monitoring system" and "said at least one electrical quantity" as "said at least one electric quantity".

Claims 31, 33-36, 38-40 and 50 are also rejected since they depend from rejected claim 30.

Claim 41 recites "one or more external physical quantities, or both, and one or more electric quantities" in line 22-24. It is unclear that it is the same "plurality of external physical quantities" and "plurality of electric quantities" recited in lines 4-5 and 12-13or not. For the purpose of examination, Examiner will assume as "one or more of said external physical

quantities, or both, and one or more of said electrical quantities".

Claims 37 and 42-46 are also rejected since they depend from the rejected claim 41.

Claim 43 recites "the communication means" and claim 45 recites "the first communication means" without proper antecedent basis in the claim. For the purpose of examination, Examine will assume as "the one or more external sensors".

Claim 47 recites "external sensors" in line 12. It is unclear they are referring to the same external physical sensors recited in line 4 or not. For the purpose of examination, Examine will assume as "said external sensors".

Claim 48 is also rejected since it depends from rejected claim 47.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***

a. Determining the scope and contents of the prior art;
b. Ascertaining the differences between the prior art and the claims in issue;
c. Resolving the level of ordinary skill in the pertinent art; and
d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

5. Claims 30-31, 33-48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Natalini** et al (**Natalini**: US 2002/0095269) in view of **Nemelka** (**Nemelka**: US 5,934,302),

further in view of **Sharood** et al. (**Sharood**: US 6,453,687) further in view of **Shibaki** et al. (**Shibaki**: US 5,960,234).

Regarding Claim 30, Natalini discloses a system for monitoring a household electric appliance being a washing machine (Fig. 1-2, 18), the monitoring system comprising:

i. a read and write memory storing a plurality of measurements of a plurality of physical quantities quantity relating to the household electric appliance within a predetermined time period during a treatment cycle (Paragraph [0027]: the readings of various sensors are continuously monitored and memory 35 retains monitored information/sensor data for at least the last operating cycle i.e. within the time period of a treatment cycle and Paragraph [0040]: monitored information/sensor data include physical quantities related to the washing machine),

ii. a first interface means to connect to one or more sensors for measuring said plurality of physical quantities of the household electric appliance, including one or more internal sensors for measuring internal physical quantities (Paragraph [0040-0041 & 0027]: monitoring subsystem 32 receives the functional data from sensors via bus 222);

iv. a means for measuring at least one electric quantity by measuring an electric current (Paragraph [0040]: current sensor 124 measures current drawn);

v. a storage means containing one or more predefined values of at least one of said plurality of physical quantities (Paragraph [0041]: sensor data are compared with the expected values and/or values from past cycles. A storage means is necessitated);

vi. a microcontroller to process a particular combination of said plurality of physical quantities and the at least one electric quantity to determine an actual combination of the internal physical quantities, one or more external physical quantities or both and one or more of said at

least one electrical quantities at an instant in time (Paragraph [0041]: the monitoring subsystem analyzes/processes the functional data from the sensors associated with the most recent operating cycle and Paragraph [0040]: monitored information/sensor data are combination of physical and electrical quantities),

to compare said actual combination to one or more respective predefined values contained in the storage means to determine at least one piece of information, each predefined value being a threshold value against which an actual value is compared to determine a proper operation of a particular component of the appliance at that instant in time (Paragraph [0040-0041]: the monitoring subsystem compares the sensor data with the expected values and/or values from past cycles to determine whether the washing machine is operating properly. Paragraph [0040]: monitored information/sensor data are combination of physical and electrical quantities); and

vii. said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said internal sensors (Paragraph [0069])

viii. a second interface means to send the at least one piece of information to a remote center for storage (Fig. 1 and 2, network interface 37 to gateway 42 and Paragraph [0054]: gateway retains data).

Natalini does not explicitly disclose a first interface means to connect a dedicated external communications network to a plurality of external physical sensors, which measure external physical quantities or said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said external sensors.

However, **Nemelka** teaches a washing machine (Fig. 1, 30) having a control means/microcontroller (22) connected to external sensors (Col 3 Lines 38- Col4 Lines 9: sensors 20, 40, 42) in a dedicated network (Fig 2, leads, 47a, 19a, 44) and the control means controls the valves i.e. adapt the operation of the household appliance based on the sensors signals (Col. 5 Lines 11-24).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to provide the external sensors and measurements of external physical quantities, as taught by **Nemelka**, as a known improvement in the base device of the appliance with predictable result of detecting the fault conditions.

The combined system of **Natalini** and **Nemelka** does not explicitly disclose the current measured by the current sensor is running through the monitoring device or the storing of a last measured value of a physical quantity causing the deletion of a first measured value within said plurality of measurements in the read and write memory.

However, the preceding limitation is known in the art of monitoring appliances. **Sharood** discloses a current sensor that measures the current running through the monitoring device (**Sharood**: Col. 9 Lines 6-12 and Fig. 6b). Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to measure the current running through the monitoring device as a known technique of sensing the current draw in the base device of the appliance with the predictable result of monitoring the functions of the appliance related to the current.

The combined system of **Natalini, Nemelka** and **Sharood** does not explicitly disclose the storing of a last measured value of a physical quantity causing the deletion of a first measured

value within said plurality of measurements in the read and write memory.

However, the preceding limitations are known in the art of memory management. **Shibaki** discloses the storing of newly generated data causing the deletion of the oldest data (col. 6 lines 58-60). Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to manage memory as taught by **Shibaki** in the combined system of **Natalini, Nemelka** and **Sharood**, as the known technique of storage in the base device of memory with the predictable results of saving the newest information when there is no empty space left in the memory.

Regarding Claim 50, the combined system of **Natalini, Nemelka**, **Sharood** and **Shibaki** discloses the system as defined in claim 30 and further discloses wherein the external sensors include further comprising: a flow sensor positioned along an associated inlet pipe and adapted to measure water flow rate supplied to the washing machine (**Nemelka:** Fig. 1, 40 and Col. 3 Lines 49-59); and a conductivity sensor positioned along a drain pipe adapted to measure the conductivity of washing liquid drained from the washing machine (**Natalini :** Paragraph [0040]: sensor 120. One of the ordinary skill in the art understands that detergent concentration can be measured by a conductivity sensor).

Regarding claim 31, the combined system of **Natalini**, **Nemelka**, **Sharood**, and **Shibaki** discloses the system of claim 30 as discussed above and further discloses at least one internal sensor within the household electric appliance where the at least one internal sensor measures a physical quantity of an internal part of the household device and that the microcontroller further processes the measurements (**Natalini**: Paragraph [0040-0041]: a second physical quantity is sensed and processed) and further to report electrical measurements (Natalini: Paragraph [0026]).

The combined system does not explicitly disclose a wireless communication device within the first interface means communicating with at least one internal sensor, said wireless communication device also adapted to function as the dedicated communication network that couples the external sensors that sense the external physical quantities to said first interface means.

However, **Sharood**, in another embodiment of the disclosed invention, teaches that the first interface means (and associated sensor) and monitoring device can be separate units and that the first interface means (and associated sensor) can be connected to the monitoring device (and therefore communication means) by another interface (element 2704, figure 27B and column 28 lines 65-67). It would have been obvious to one of ordinary skill in the art at the time on the invention to use a wireless connection as the interface to reduce the amount of cabling used thereby making it easier to connect the sensor to the monitoring device and increasing the ease of installation and modification (i.e. not limited to a certain cable length).

Regarding claim 33, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 30 as discussed above. The combination further discloses a timing unit, where the timing unit determines time to be associated with the measurements of the one or more physical quantities and at least one electrical quantity (Natalini: Paragraph [0027]: the subsystem combines the functional data i.e. physical and electrical quantities into historical data, Paragraph [0050]: historical data are associated with the time).

Regarding claim 34, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 30 as discussed above and further discloses that the at least one electrical quantity includes at least one of the following: momentary electric current drawn by

the household electric appliance, line voltage applied to the household electric appliance, momentary electric power drawn by the household electric appliance, electric energy consumption of the household electric appliance within a predefined time period, a power factor of the load represented by the household electric appliance, cos(φ) of the load represented by the household electric appliance, and type of reactive power of the load represented by the household electric appliance (**Natalini**: Paragraph [0040-0041]: current drawn).

Regarding claim 35, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 30 as discussed above and further discloses that the first interface is connected to the one or more sensors through a wireless connection (**Natalini**: Paragraph [0026]).

Regarding claim 36, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 30 as discussed above. The combination further discloses that the second interface means is connected to the remote center through a wireless connection (**Natalini**: Paragraph [0026]).

Regarding claim 38, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 30 as discussed above. The combination further discloses that said at least one physical quantity includes at least one of: temperature, flow rate, conductivity, weight, absolute humidity, relative humidity, pressure, linear displacement, linear velocity, linear acceleration, angular displacement, angular velocity, angular acceleration, chemical concentration, sound pressure, sound intensity, light intensity, oscillation frequency, and oscillation amplitude (**Natalini**: Paragraph [0040]: concentration of laundry detergent).

Regarding claim 39, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki**

discloses the system of claim 30 as discussed above and further discloses that an information storage means for storing the at least one piece of information in the read and write memory (**Natalini**: Fig. 3, step 312 and Paragraph [0037 and 0042]: the appropriate flag 228 is set to indicate that the alarm message that identifies the fault).

Regarding claim 40, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 30 as discussed above and further discloses that the household electric appliance is one of a laundry washing machine and a washing/drying machine adapted to perform at least one wash treatment on textile items, said at least one physical quantity being preferably at least one of the following: weight of the textile items being present in the basket of the washing machine or the washing/drying machine, flow rate of water supplied to the washing machine or the washing/drying machine, temperature of washing liquid contained in a tub of the washing machine or the washing/drying machine, and conductivity of the washing liquid drained by the washing machine or the washing/drying machine, where the washing liquid comprises water and at least one washing agent (**Natalini**: Paragraph [0040] washing machine 18 with sensor for concentration of the detergent. One of the ordinary skill in the art understands that concentration of the detergent can be sensed by the conductivity sensor).

Regarding Claim 41, Natalini discloses a monitoring system for use with a household electric appliance, the monitoring system comprising:

i. a read and write memory storing a plurality of measurements of a plurality of internal physical quantities, and a plurality of electrical quantities related to the household electric appliance, said measurement being taken within a predetermined time period during a treatment cycle (Paragraph [0027]: the readings of various sensors are continuously monitored and

memory 35 retains monitored information for at least the last operating cycle i.e. within the time period of a treatment cycle and Paragraph [0040]: monitored information includes internal physical quantities and electrical quantities related to the washing machine),

ii. means for coupling a plurality of internal physical sensors for measuring one or more of a plurality of internal physical quantities (Paragraph [0041]: processor 33 and bus 222, Paragraph [0041]: monitoring subsystem 32 receives the functional data from sensors and Paragraph [0040]: sensors are internal), where the one or more internal physical sensors are connected to the monitoring device by way of an electronic control means and the first interface means (Fig. 2 and Paragraph [0041], processor 33 and Bus 222);

iii. a means for measuring at least one electric quantity by measuring an electric current (Paragraph [0040]: current sensor 124 measures current drawn);

iv. a microcontroller configured to:

a) process measurements of a combination of one or more internal physical quantities, one or more external physical quantities, or both, and one or more electric quantities to determine at least one piece of information relating to or being employed in said treatment cycle during operation of the household electric appliance, where the at least one piece of information includes at least one of: functional information, statistical information, and diagnostic information relating to the household electric appliance (Paragraph [0041]: the monitoring subsystem determines whether the washing machine is operating properly i.e. the functional information by analyzing/processing the functional data from the sensors and Paragraph [0040] the functional data from sensors includes physical and electrical quantities) by comparing a value of said one physical internal

quantity and at least one electrical quantity with one or more predefined values that relate to values for the treatment being performed by the appliance at an instant in time (Paragraph [0040-0041]: the monitoring subsystem compares the sensor data with the expected values and/or values from past cycles);

b) said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said internal sensors (Paragraph [0069]) and

v. an information storage means for storing the at least one piece of information in the read and write memory (Fig. 3, step 312 and Paragraph [0037 and 0042]: the appropriate flag 228 is set to indicate that the alarm message that identifies the fault).

Natalini does not explicitly disclose a first interface means to connect a dedicated external communications network to a plurality of external physical sensors, which measure external physical quantities or said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said external sensors.

However, **Nemelka** teaches a washing machine (Fig. 1, 30) having a control means/microcontroller (22) connected to external sensors (Col 3 Lines 38- Col4 Lines 9: sensors 20, 40, 42) in a dedicated network (Fig 2, leads, 47a, 19a, 44) and the control means controls the valves i.e. adapt the operation of the household appliance based on the sensors signals (Col. 5 Lines 11-24).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to provide the external sensors and measurements of external physical quantities, as taught by **Nemelka**, as a known improvement in the base device of the appliance with predictable result of detecting the fault conditions.

The combined device of **Natalini** and **Nemelka** does not explicitly disclose the measured current is the current running through the monitoring device or extrapolation from said plurality of measurements of said at least one physical quantity a data packet representative of the evolution of said at least one physical quantity within said predefined time period over one or more treatment cycles.

However, the preceding limitation is known in the art of monitoring appliances. **Sharood** discloses a current sensor that measures the current running through the monitoring device (**Sharood**: Col. 9 Lines 6-12 and Fig. 6b). Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to measure the current running through the monitoring device as a known technique of sensing the current draw in the base device of the appliance with the predictable result of monitoring the functions of the appliance related to the current.

Sharood further discloses an appliance monitoring system that extrapolates the time of failure from the measured conditions at intervals designated by the user (**Sharood**: Col. 27, lines 30-40: calculating the speed at which temperature is rising to estimate i.e. extrapolate how long it will be until food spoilage occurs). **Natalini** also teaches that warning for an appliance is also desirable before the actual failure occurs (Paragraph [0044]).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to extrapolate a data packet from the measurements of said at least one physical quantity over a predetermined time period, as taught by **Sharood**, in the system of **Natalini** and **Nemelka**, as a known improvement in the base device of appliance monitoring system, with the predictable result of preventing the imminent failure.

The combined system of **Natalini, Nemelka** and **Sharood** does not explicitly disclose the storing of a last measured value of said at least one physical quantity causing the deletion of a first measured value within said plurality of values in the read and write memory.

However, the preceding limitations are known in the art of memory management. **Shibaki** discloses the storing of newly generated data causing the deletion of the oldest data (col. 6 lines 58-60). Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to manage memory as taught by **Shibaki** in the combined system of **Natalini, Nemelka** and **Sharood**, as the known technique of storage in the base device of memory with the predictable results of saving the newest information when there is no empty space left in the memory.

Regarding claim 37, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 41 as discussed above. The combination further discloses that the household electric appliance includes one of: a clothes dryer, a washing/drying machine, a dishwasher, a refrigerator, a freezer, a refrigerator/freezer, an electric oven, a gas oven, a microwave oven, a gas cooking top, an electric cooking top, a magnetic induction cooking top, a kitchen hood, a conditioner, a gas boiler, an electric water heater, an air conditioner, a hair dryer, an iron, a Hi-Fi system, a mixer or any other electric kitchenware, a lighting device, an alarm device (**Natalini**: washing machine 18).

Regarding claim 42, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 41 as discussed above. The combination further discloses that the first interface means is an electric cable to the one or more external sensors *(***Nemelka:** Fig. 2 and col. 4 Lines 50-67*)*.

Regarding claim 43, the combined device of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the device of claim 41 as discussed above. The combination further discloses that the first interface means is wirelessly connected to the communication means (Nemelka: Fig. 2 and col. 4 Lines 50-67). It would have been obvious to one of ordinary skill in the art at the time on the invention to use a wireless connection as the interface to reduce the amount of cabling used thereby making it easier to connect the sensor to the monitoring device and increasing the ease of installation and modification (i.e. not limited to a certain cable length).

Regarding claim 44, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 41 as discussed above. The combination further discloses that the first interface means is wirelessly connected to the one or more external sensors (Nemelka: Fig. 2 and col. 4 Lines 50-67). It would have been obvious to one of ordinary skill in the art at the time on the invention to use a wireless connection as the interface to reduce the amount of cabling used thereby making it easier to connect the sensor to the monitoring device and increasing the ease of installation and modification (i.e. not limited to a certain cable length).

Regarding claim 45, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 41 as discussed above and further discloses that the first interface means is connected to the communication means (Nemelka: Fig. 2 and col. 4 Lines 50-67).

Regarding claim 46, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 41 as discussed above and further discloses that the communication means and the one or more internal sensors are connected through an electronic control means, where the electronic control means collect, stores, and processes the measurements from the one or more physical quantities from the one or more internal sensors (**Natalini**: Paragraph [0041]

and Fig. 2, 37, subsystem 32 with processor 33 receives sensor data and send via network interface).

Regarding Claim 47, Natalini discloses a system for monitoring a household electric appliance, the system comprising:

a) a household electric appliance (Fig. 1, washing machine 18);

an electronic control means connected to one or more internal sensors, where the one or more internal sensors measure one or more physical internal quantities or one or more electrical quantities of the household electric appliance, the electronic control means configured to collect, store, and process measurements of the one or more physical and electrical internal quantities being internal measurements (*Paragraph [0041]: monitoring subsystem 32 receives and analyzes/processes the sensor data from sensors and stores the sensor data from past cycles Paragraph [0040]: sensors are internal and sensor data are measurements of physical quantities and electrical quantities*);

a communication means communicating with the electronic control means to transfer one or more of said internal measurements, over a predetermined time period to a first interface means on a monitoring device (Paragraph [0041]: monitoring subsystem receives sensor data over the bus 222);

c) the monitoring device including:

a. a read and write memory storing a plurality of measurements of said plurality of internal physical quantities and a plurality of electrical quantities, within a predetermined time period, (*Paragraph [0027]: the readings of various sensors are continuously monitored and memory 35 retains monitored information for at least the last operating cycle i.e. within the time*

period of a treatment cycle and Paragraph [0040]: monitored information includes physical quantities related to the washing machine),

b. the first interface means to connect to said dedicated communication network to receive the measurements of the one or more of said plurality of physical internal quantities (*Paragraph [0041]: monitoring subsystem receives sensor data over the bus 222*),

c. a means for measuring at least one electric quantity by measuring an electric current (*Paragraph [0040]: current sensor 124 measures current drawn*),

d. a timing unit to associate an instant in time at which the measurements of the one or more physical quantities and the at least one electric quantity are taken (*Paragraph [0027]: the subsystem combines the functional data i.e. physical and electrical quantities into historical data, Paragraph [0050]: historical data are associated with the time*),

e. a microcontroller configured to:

(i) process the measurements of one or more physical internal quantities, and the at least one electric quantity, at the instant in time, to determine sensed information relating to the household electric appliance, where the sensed information includes functional information, statistical information, and diagnostic information relating to the household electric appliance (*Paragraph [0040] the functional data from sensors includes physical and electrical quantities. Paragraph [0041]: the monitoring subsystem analyzes i.e. processes the functional data from the sensors and determines whether the washing machine is operating properly i.e. the functional information. Paragraph [0027]: statistical data. Paragraph [0042]: message that identifies the indicated fault*), said sensed information being a combination of values of physical internal quantity and at

least one electric quantity with a reference combination of physical and electrical quantities being the combination that best represents the proper operation of the appliance at that instant in time (*Paragraph [0040-0041]: the monitoring subsystem compares the sensor data with the expected values and/or values from past cycles. The expected values and/or values from past cycles represents the proper operation of the appliance since the proper operation is determined based on comparison with these values*), and said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said internal sensors (*Paragraph [0069]*) and

(ii) collect information that allows the system to trace a history of the monitored electric appliance that permits the microprocessor to build in the read and write memory, profiles being indicative of a trend within a predefined time period of a particular physical quantity or typology of information obtained by the microcontroller based upon values detected by said internal and external sensors (*Paragraph [0027]: the subsystem also combines the functional data for a series of operating cycles into historical data and aggregates the historical data into statistical data that relates to all of the cycles performed by the intelligent appliance*); and

f. a second interface means to send the at least one piece of information to a remote center (*Paragraph [0045] and Fig. 2, network interface 37*); and

g. the remote center configured to collect the at least one piece of information from one or more monitoring devices connected to respective household electric appliances and to extract statistical information about the household electric appliances being monitored *(Paragraph [0031]*).

Natalini does not explicitly disclose a first interface means to connect a dedicated external communications network to a plurality of external physical sensors, which measure external physical quantities or said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said external sensors.

However, **Nemelka** teaches a washing machine (Fig. 1, 30) having a control means/microcontroller (22) connected to external sensors (Col 3 Lines 38- Col4 Lines 9: sensors 20, 40, 42) in a dedicated network (Fig 2, leads, 47a, 19a, 44) and the control means controls the valves i.e. adapt the operation of the household appliance based on the sensors signals (Col. 5 Lines 11-24).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to provide the external sensors and measurements of external physical quantities, as taught by **Nemelka**, as a known improvement in the base device of the appliance with predictable result of detecting the fault conditions.

The combined system of **Natalini** and **Nemelka** does not explicitly disclose the measured current is the current running through the monitoring device or extrapolation from said plurality of measurements of said at least one physical quantity a data packet representative of the evolution of said at least one physical quantity within said predefined time period over one or more treatment cycles.

However, the preceding limitation is known in the art of monitoring appliances. **Sharood** discloses a current sensor that measures the current running through the monitoring device (**Sharood**: Col. 9 Lines 6-12 and Fig. 6b). Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to measure the current running

through the monitoring device as a known technique of sensing the current draw in the base device of the appliance with the predictable result of monitoring the functions of the appliance related to the current.

Sharood further discloses an appliance monitoring system that extrapolates the time of failure from the measured conditions at intervals designated by the user (**Sharood**: Col. 27, lines 30-40: calculating the speed at which temperature is rising to estimate i.e. extrapolate how long it will be until food spoilage occurs). **Natalini** also teaches that warning for an appliance is also desirable before the actual failure occurs (Paragraph [0044]).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to extrapolate a data packet from the measurements of said at least one physical quantity over a predetermined time period, as taught by **Sharood**, in the system of **Natalini and Nemelka**, as a known improvement in the base device of appliance monitoring system, with the predictable result of preventing the imminent failure.

The combined system of **Natalini, Nemelka** and **Sharood** does not explicitly disclose the storing of a last measured value of said at least one physical quantity causing the deletion of a first measured value within said plurality of values in the read and write memory.

However, the preceding limitations are known in the art of memory management. **Shibaki** discloses the storing of newly generated data causing the deletion of the oldest data (col. 6 lines 58-60). Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to manage memory as taught by **Shibaki** in the combined system of **Natalini, Nemelka** and **Sharood**, as the known technique of storage in the base device of memory with the predictable results of saving the newest information when there is no empty

space left in the memory.

Regarding claim 48, the combined system of **Natalini**, **Nemelka**, **Sharood** and **Shibaki** discloses the system of claim 47 as discussed above. **Natalini** further discloses that the remote center receives a plurality of information sent by the monitoring device that the remote center collects and sorts for the purpose of identifying at least one parameter related to the operation of a washing machine or a washing/drying machine, the at least one parameter being preferably at least one of the following: number of wash treatments performed by the washing machine or the washing/drying machine within a predefined time interval, quantity and typology of textile items loaded on average by a user for each wash treatment, quantity and typology of washing agents loaded on average by the user for each wash treatment, average quantity of water used by the washing machine or the washing/drying machine for each wash treatment, and average electric energy absorbed by the washing machine or the washing/drying machine for each wash treatment (Natalini: Paragraph [0069]).

6. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Appel** et al. (**Appel**: US 2003/0116177) in view of **Hallman et al. (Hallman:** US 2003/0196277)**,** further in view of **Nemelka.**

Regarding Claim 51, **Appel** discloses a system for monitoring a washing machine, comprising

a flow sensor positioned along an associated inlet pipe externally to said washing machine and adapted to measure water flow rate supplied to the washing machine; a conductivity sensor positioned along a drain pipe adapted to measure the conductivity of washing liquid as the

liquid drains from the washing machine (Paragraph [0014]: sensor for water inlet flow and sensor for degree of soiling through conductivity measurement and sensors can be installed in the drain or in the conduit leading into the dispensing compartment and Paragraph [0013] & [0026]: sensors are non-intrusively connected with the existing washing machine without invading of the machine housing);

a microcontroller configured to receive measurements from sensors associated with the washing machine; a dedicated communication network having a coupling to the flow sensor and the conductivity sensor, said network being coupled externally of the washing machine to the microcontroller (Paragraph [0014]: sensors can be wiredly or wirelessly remotely connected with the means of receiving signals in the container house and the computer program controls the dispensing sequence based on the combinations of sensor readings. A microcontroller is necessitated to execute the computer program. Paragraph [0013] & [0026]: sensors are non-intrusively connected with the existing washing machine without invading of the machine housing); and

a read and write memory storing a plurality of measurements of at least one physical quantity relating to the washing machine's operation, to provide a historical analysis of the operation of the washing machine (Paragraph [0014]: a database in which the results of various readings are stored).

Appel does not explicitly disclose said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said flow sensor and conductivity sensors.

However, Hallman teaches a washing machine (1000) that includes a conductivity sensor

(Fig. 2, 151) and the controller (Fig. 7, 5) to adapt the operation of the household appliance based upon data detected by said conductivity sensor (Paragraph [0029]).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to combine Appel's dosing controller and Hallman's controller to adapt the operation of the household appliance in order to reduce the cost.

The combination of Appel and Hallman does not explicitly disclose said microcontroller being configured to adapt the operation of the household appliance based upon data detected by said flow sensor.

However, **Nemelka** teaches a washing machine (Fig. 1, 30) having a control means/microcontroller (22) connected to external sensors (Col 3 Lines 38- Col4 Lines 9: sensors 20, 40, 42) in a dedicated network (Fig 2, leads, 47a, 19a, 44) and the control means controls the valves i.e. adapt the operation of the household appliance based on the flow sensors signals (Col. 5 Lines 11-24).

Therefore, it would have been obvious to the one of the ordinary skill in the art at the time of the invention was made to adapt the operation of the household appliance based on the flow sensors signals, as taught by **Nemelka**, as a known improvement in the base device of the appliance with predictable result of detecting the fault conditions.

Response to Arguments

7. Applicant's arguments filed on October 14, 2011 have been fully considered but they are moot in view of new grounds of rejections.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nay Tun whose telephone number is (571) 270-7939. The examiner can normally be reached on Mon-Thurs from 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Daniel Wu can be reached on (571) 272-2964. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private

PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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